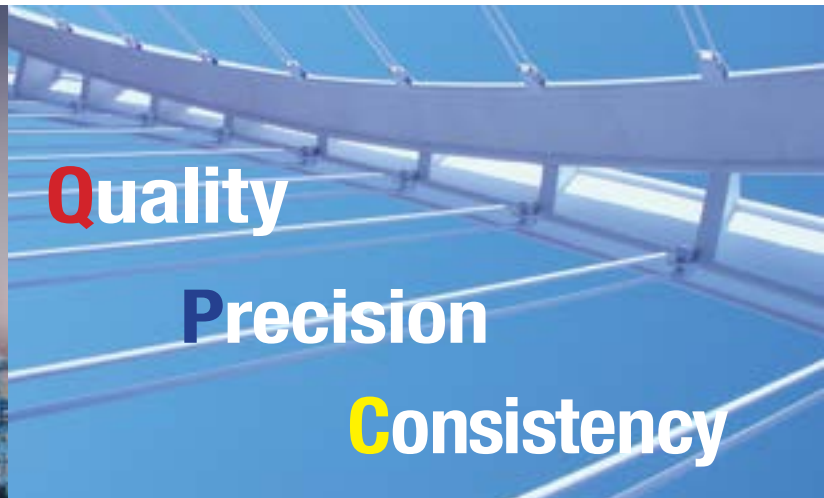




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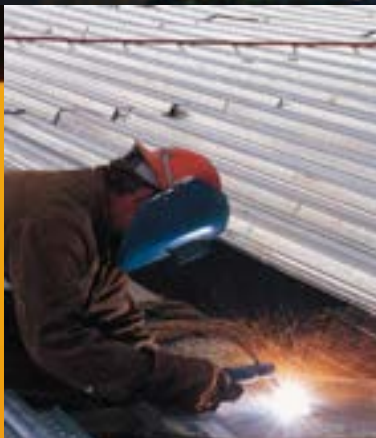
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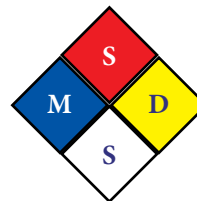
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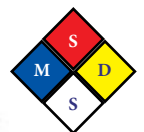
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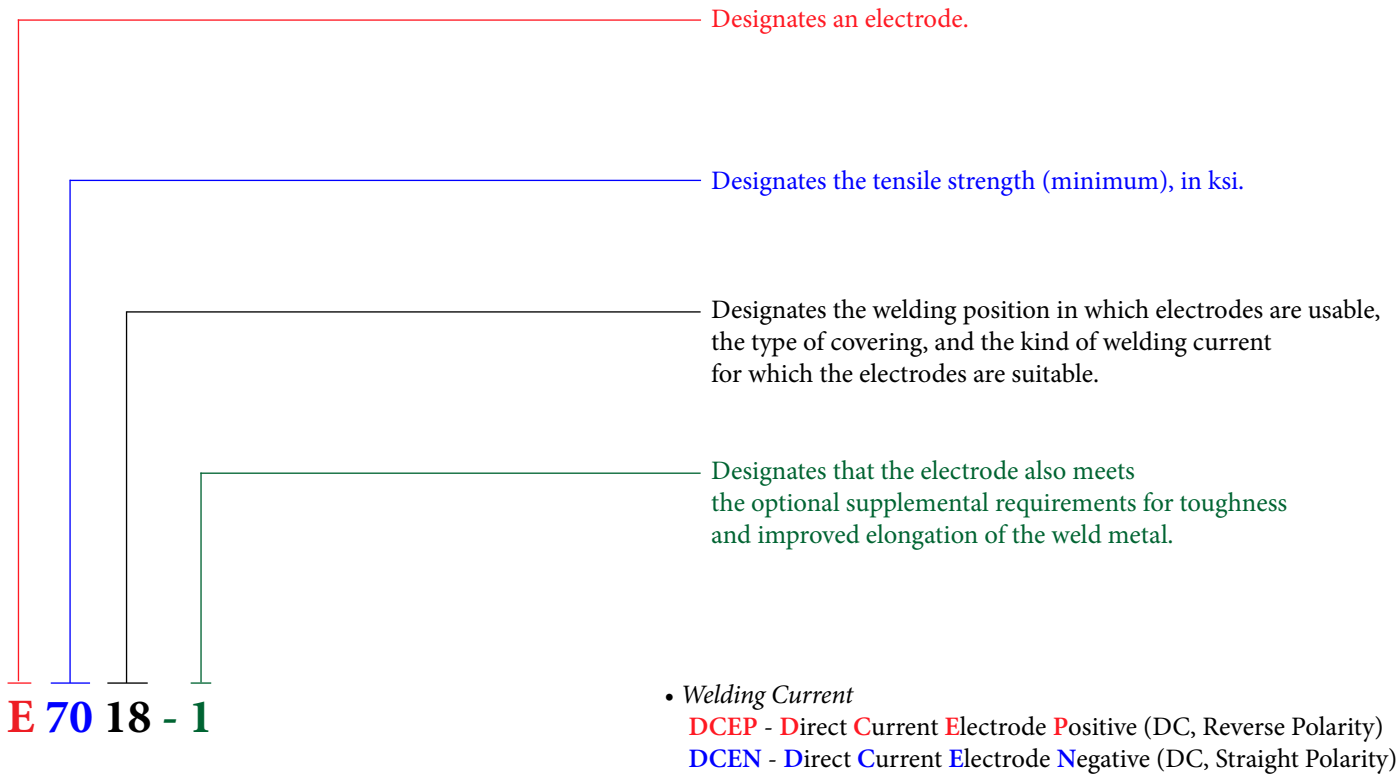
Coated Electrode

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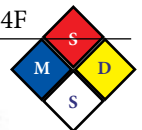
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Order of Mandatory Classification Designators AWS/SFA A5.1



- *Welding Position*

Type of Welding	Welding Position	Designation	
		BS EN	AWS
Butt Welding	Flat	PA	1G
	Horizontal	PC	2G
	Vertical Downwards	PG	3G
	Vertical Upwards	PF	3G
	Overhead	PE	4G
Fillet Welding	Flat	PA	1F
	Horizontal	PB	2F
	Vertical Downwards	PG	3F
	Vertical Upwards	PF	3F
	Horizontal Overhead	PD	4F



AFM E6010

AWS/SFA A5.1

High Cellulose Sodium Covering

Description:

AFM E6010 is a high cellulose coated “fastfreeze” electrode. It produces a deep penetrating, forceful, spray type arc and readily removable, thin, friable slag which may not seem to completely cover the weld bead. It can be used for welding in the flat, vertical-up, vertical-down and overhead positions with DC reverse polarity.

Welding Characteristics:

AFM E6010 will provide good arc stability with light slag while welding dirty, rusty or painted material that cannot thoroughly be cleaned. It will produce high deposition and low spatter loss in addition to a weld puddle that wets and spreads well. Its “fast-freeze” characteristic allows it to set up fast enough to make it ideal for vertical up and vertical down welding and is frequently selected for welding pipe.

Applications:

AFM E6010 is recommended for welding API grades A25, A, B, and X42 pipe and in shipbuilding, buildings, bridges, storage tanks, piping, and pressure vessel fittings.

Recommended Current Ranges (DC+):

Dia. (inch)	3/32”	1/8”	5/32”	3/16”
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	60 ~ 85	80 ~ 120	110 ~ 160	150 ~ 200
V & O	50 ~ 70	70 ~ 110	110 ~ 150	130 ~ 170

Typical Mechanical Properties:

Tensile Strength	psi	70,000
Yield Strength	psi	61,000
Elongation in 2”	(%)	30
Reduction in Area	(%)	60
Charpy V-Notch	@ -20°F	36ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.13	0.51	0.20	0.014	0.006

Standard Packaging:
10# Package; 60# Master Carton.



AFM E6011

AWS/SFA A5.1

High Cellulose Potassium Covering

Description:

AFM E6011 is a high-cellulose potassium electrode designed to be used with AC current and to duplicate the usability characteristics and mechanical properties of AFM E6010.

Although AFM E6011 is usable with dcep (electrode positive), a decrease in joint penetration will be noted when compared to AFM E6010.

Welding Characteristics:

AFM E6011 will have similar arc action, slag, and fillet weld appearance to those of AFM E6010.

The use of AC current with AFM E6011 will eliminate arc blow sometimes experienced with AFM E6010 DC current.

Applications:

AFM E6011 is commonly used for welding mild steels such as ASTM A-36, A-283, A-284, A-285, A-515, and A-516.

Typical applications are railroad cars, truck frames, storage tanks, bridges, boilers, barges and ships.

Recommended Current Ranges (AC or DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	65 ~ 90	80 ~ 120	130 ~ 170	170 ~ 210
V & O	50 ~ 75	70 ~ 110	110 ~ 150	130 ~ 170

Typical Mechanical Properties:

Tensile Strength	psi	69,000
Yield Strength	psi	68,000
Elongation in 2"	(%)	29
Reduction in Area	(%)	60
Charpy V-Notch	@ -20°F	36ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.13	0.50	0.19	0.015	0.008

Standard Packaging:

10# Package; 60# Master Carton.



AFM E6013

AWS/SFA A5.1

High Titania Potassium Covering

Description:

AFM E6013 is a versatile electrode with a wide variety of applications for light gauge and heavy plate. Slag removal is easy, often is self cleaning on heavy plate, and has a smooth arc transfer with a fine ripple bead appearance.

Welding Characteristics:

AFM E6013 produce a flat fillet weld face and are suitable for making groove welds because of their concave weld face and easily removable slag.

Welds with the smaller diameters often meet the Grade 1 radiographic requirements.

Applications:

AFM E6013 is a high titania general purpose coated electrode.

It is commonly used for auto bodies and fenders, farm implements, metal furniture and any application where low spatter and good bead appearance is desirable.

Recommended Current Ranges (AC or DC-):

Dia. (inch)	1/16"	5/64"	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	1.6 mm	2.0 mm	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	25 ~ 50	35 ~ 60	50 ~ 100	80 ~ 130	140 ~ 180	180 ~ 230
V & O	25 ~ 50	35 ~ 60	50 ~ 90	60 ~ 110	110 ~ 160	120 ~ 160

Typical Mechanical Properties:

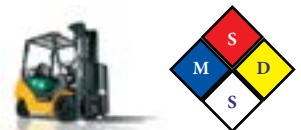
Tensile Strength	psi	67,000
Yield Strength	psi	62,000
Elongation in 2"	(%)	29
Reduction in Area	(%)	58
Charpy V-Notch	@ 32°F	58ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.08	0.38	0.38	0.014	0.008

Standard Packaging:

10# Package; 60# Master Carton.



AFM E7014

AWS/SFA A5.1

Iron Powder, Titania Covering

Description:

AFM E7014 is similar to AFM E6013, but with the addition of iron powder for obtaining higher deposition efficiency.

The iron powder also permits the use of higher welding currents.

Welding Characteristics:

AFM E7014 fillet welds tend to be flat to slightly convex. The slag is easily removed and in most cases removes itself.

The joint penetration obtained allows for welding over a wide root opening due to poor fit.

Applications:

AFM E7014 is commonly used for welding mild steels ASTM A-36, A-113, A-283, A-284, A-285, A-306, A-515, and A-516.

Typical applications include construction equipment, metal fixtures, automotive parts, barges and farm machinery.

Recommended Current Ranges (AC or DC±):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	50 ~ 100	90 ~ 140	150 ~ 210	200 ~ 240
V & O	40 ~ 65	60 ~ 90	110 ~ 160	120 ~ 160

Typical Mechanical Properties:

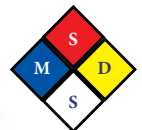
Tensile Strength	psi	79,800
Yield Strength	psi	68,500
Elongation in 2"	(%)	30
Reduction in Area	(%)	44
Charpy V-Notch	@ 32°F	58 ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.08	0.60	0.35	0.015	0.019

Standard Packaging:

10# Package; 60# Master Carton.



AFM E7018

AWS/SFA A5.1

Low Hydrogen Potassium, Iron Powder Covering

Description:

AFM E7018 is an all position iron powder, low hydrogen electrode that may be used with AC or DC reverse polarity.

Welding Characteristics:

AFM E7018 has a smooth, quiet arc, very low spatter, and medium arc penetration that can be used at high travel speeds.

The fillet welds in the horizontal and flat welding positions have a slightly convex weld face, with a smooth and finely rippled surface.

Applications:

AFM E7018 is used for welding carbon and low alloy steels, and are also used for joints involving high-strength and high carbon.

As is common with all low hydrogen electrodes, a short arc length should be maintained at all times.

Recommended Current Ranges (AC or DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	55 ~ 85	90 ~ 140	130 ~ 185	190 ~ 250
V & O	55 ~ 80	80 ~ 120	110 ~ 180	160 ~ 210

Typical Mechanical Properties:

Tensile Strength	psi	78,000
Yield Strength	psi	66,000
Elongation in 2"	(%)	31
Reduction in Area	(%)	75
Charpy V-Notch	@ -20°F	65 ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.04	1.06	0.69	0.012	0.011

Standard Packaging:
10# Package; 60# Master Carton.



AFM E7018-1

AWS/SFA A5.1

Low Hydrogen Potassium, Iron Powder Covering

Description:

AFM E7018-1 is an all position low hydrogen iron powder electrode that is intended for welds requiring a lower transition temperature than is normally available from E7018 electrodes.

It is designed to have the same usability and weld metal composition as AFM E7018, except that the manganese content is set at the high end of the range.

Applications:

AFM E7018-1 is used for welding the wide variety of carbon and low alloy steels that require impact toughness at low temperatures.

Welding Characteristics:

AFM E7018-1 displays exceptional impacts at low temperatures and has a smooth metal transfer that keeps spatter to a minimum with easily removable slag.

Recommended Current Ranges (AC or DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	55 ~ 85	90 ~ 140	130 ~ 185	190 ~ 250
V & O	55 ~ 80	80 ~ 120	110 ~ 180	160 ~ 210

Typical Mechanical Properties:

Tensile Strength	psi	81,600
Yield Strength	psi	69,000
Elongation in 2"	(%)	30
Reduction in Area	(%)	72
Charpy V-Notch	@ -50°F	104 ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.05	1.30	0.50	0.012	0.011

Standard Packaging:
10# Package; 60# Master Carton.



AFM E7024

AWS/SFA A5.1

Iron Powder, Titania Covering

Description:

AFM E7024 is a high speed, heavy-coated, iron powder electrode. The coverings usually amount to about 50% of the weight of the electrode, resulting in higher deposition efficiency.

Applications:

AFM E7024 can be used on mild and some alloy steels used in earth-moving and construction equipment, truck bodies, ships, barges, and railcars.

Welding Characteristics:

AFM E7024 electrodes are characterized by having a quiet arc, very low spatter, low arc penetration and are well suited for making fillet welds in the flat or horizontal position.

The weld face is slightly convex to flat and has a very smooth surface with a very fine ripple.

They can be used with high travel speeds.

Recommended Current Ranges (AC or DC±):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Flat	100 ~ 145	140 ~ 190	180 ~ 250	230 ~ 305

Typical Mechanical Properties:

Tensile Strength	psi	82,000
Yield Strength	psi	74,000
Elongation in 2"	(%)	25
Reduction in Area	(%)	65
Charpy V-Notch	@ -18°F	25 ft. Lbs

Typical Weld Metal Chemistry (%):

C	Mn	Si	P	S
0.06	0.86	0.62	0.011	0.017

Standard Packaging:

10# Package; 60# Master Carton.

